

REMARKS

Review and consideration of the application in view of Applicants' amendments and following remarks are respectfully requested. Claims 50 and 51 are cancelled without prejudice to or disclaimer of the subject matter set forth therein to further prosecution. Claims 1 and 27 are amended to more clearly set forth the structure of the product claimed. Withdrawn method claims 44 and 49 are amended to reflect the language of claims 1 and 27, such that the method claims include all the features of product claim 1 or 27.

Applicants thank the Examiner for reconsideration and withdrawal of various rejections over Charych et al., Walt et al., or Anderson et al., alone or in combination with one or more of McGall et al., Chang et al., or Anderson et al. For at least the following reasons, Applicants submit all of claims 1-14, 26-28, 30-34, 43-46, 48, and 49 are in condition for allowance.

Withdrawn Claims

Claims 44-46, 48, and 49 are withdrawn from consideration by the Patent Office as drawn to inventions distinct from the invention originally claimed. As amended herein, method Claim 44 includes all the features of product Claim 27, and method Claim 49 depends from and includes all the features of product Claim 1. Upon allowance of a respective product claim, Applicants respectfully request rejoinder of claims 44 and 49, and the claims dependent therefrom, under MPEP §821.04.

35 U.S.C. §102(b) over Sutton et al.

Claims 1-8, 13, 15-17, and 21 are rejected under 35 U.S.C. §102(b) as being anticipated by Sutton et al. (US 5,714,340). According to the Office Action, Sutton et al. discloses a composition comprising microspheres dispersed in a fluid containing a coating aid and a gelling agent, wherein the gelling agent forms a gel capable of immobilizing the microspheres at random positions on a substrate. For at least the following reasons, Applicants respectfully traverse this rejection.

Sutton et al. does not teach, disclose or suggest the subject matter of the claimed invention as set forth in independent claim 1, from which claims 2-

8, 13, 15-17, and 21 depend. Sutton et al. is directed to an immunoassay element for assaying ligands, wherein the element includes a layer containing a labeled ligand, a bead spreading layer, a cross-linked hydrophilic polymer layer including receptors, and a support. Neither the beads of the bead spreading layer nor the receptors of the cross-linked hydrophilic polymer layer can be compared to the microspheres of the claimed composition of claim 1.

The beads of the bead spreading layer of Sutton et al., as shown in Figure 1, form a stack comprising multiple layers of beads. In contrast, the claimed invention has a single layer of microspheres on a substrate.

The receptors shown in Figures 3-5 and discussed at col. 10, lines 3-11, of Sutton et al., form clusters in the cross-linked hydrophilic polymer layer. In contrast, the claimed invention is directed to microspheres that are randomly dispersed with a uniform density on a substrate, as explained and exemplified in Example 2, at page 11, lines 21-28, of Applicants' specification. The clustered receptors of Sutton are not randomly dispersed with a uniform density, as claimed by Applicants. Further, as shown in Applicants' Example 2, without use of the claimed invention, streaking can occur in the coating, wherein the streaking corresponds to aggregates of microspheres on the substrate, such as those found in Sutton et al.

Sutton et al. does not teach all the elements of the claimed invention. For example, Sutton et al. does not teach at least a composition comprising microspheres in a single layer randomly dispersed with a uniform density on a substrate. For at least the above reasons, reconsideration and withdrawal of the rejection are in order and are respectfully requested.

35 U.S.C. §102(b) over Pierce et al.

Claims 1-24, 26 and 50 are rejected under 35 U.S.C. §102(b) as being anticipated by Pierce et al. (US 4,258,001). According to the Office Action, Pierce et al. teaches a coating composition including microspheres dispersed in a fluid containing a coating aid and a gelling agent wherein the gelling agent forms a gel immobilizing the microspheres at random positions on a substrate. Claim 50 is cancelled, rendering the rejection of the claim moot. For at least the following reasons, Applicants traverse the rejection with regard to claims 1-24 and 26.

Pierce et al. does not teach, disclose or suggest the subject matter of the claimed invention as set forth in the cited claims, and as exemplified by independent claim 1. Pierce et al. is directed to an element for analysis or transport of a liquid, wherein the element includes particles with an adhesive surface forming a three-dimensional structure. This is exemplified in Figures 2-14, cited in the Office Action as exemplary of the Pierce et al. teaching. As stated at col. 6, lines 49-51, of Pierce et al., formation of a coherent, three-dimensional lattice by organopolymeric particles is “an essential feature of the invention.” Applicants’ invention, as set forth in independent claim 1 and the claims dependent therefrom, has a single layer of microspheres randomly dispersed with a uniform density on a substrate. Pierce et al. does not teach, disclose, or suggest a single layer of microspheres having a uniform density, as admitted at page 11, section 12, of the Office Action. In fact, Pierce et al. teaches away from two-dimensional structures. For at least the above reasons, reconsideration and withdrawal of the rejection are in order and are respectfully requested.

35 U.S.C. §103(a) over Pierce et al. in view of Walt et al. and Han et al.

Claims 27, 28, 30-34, 43, and 51 are rejected under 35 U.S.C. §103(a) over Pierce et al. (US 4,258,001) in view of Walt et al. (WO 00/16101) and Han et al. (Nature Biotechnology, 2001, 19:631-635). According to the Office Action, Pierce et al. teaches a coating composition including microspheres dispersed in a fluid containing a coating aid and a gelling agent wherein the gelling agent forms a gel immobilizing the microspheres at random positions on a substrate, but does not teach or disclose that the microspheres are immobilized in a single layer having a uniform density. The feature of a single layer of microspheres randomly immobilized at a uniform density in a microarray is asserted in the Office Action to be well known, as taught in Walt et al. and Han et al. Han et al. is cited for teaching a motivation to provide a single layer of microspheres of uniform density, that is simultaneous detection of multiple targets in high density arrays. Claim 51 is herein canceled, rendering the rejection moot. For at least the following reasons, Applicants traverse the rejection of claims 27, 28, 30-34, and 43.

As admitted in the Office Action, Pierce et al. does not teach or disclose microspheres immobilized in a single layer having a uniform density.

Walt et al. discloses a microarray formed using microspheres dispersed on a substrate having discrete sites, as described on page 22, lines 9-22, such that each microsphere attaches to a discrete site on the substrate. A thin film formed over the microspheres is used to hold them in place on the substrate (see lines 15-16 of page 22). The substrates can include etched optical imaging fiber (Fig. 11A) or a patterned polymer substrate (Fig. 11B). Walt et al. does not disclose or suggest a gel containing a single layer of microspheres randomly distributed with a uniform density on a substrate, and therefore does not overcome the deficiencies of Pierce et al. Further, Walt et al. specifically teaches and exemplifies the use of premarked or well-containing substrates, and therefore teaches away from the subject matter of dependent claim 43.

Han et al. is directed to optical coding of polymer beads using highly luminescent quantum dots (QDs). The paragraphs referred to by the Office Action, the first full paragraph of the right column of page 632, and the paragraph bridging pages 634-635, discuss the incorporation of more than one quantum dot into a polymer bead to produce a unique optical signature, and the spatial arrangements of the quantum dots in a given polymer bead. Han et al. does not disclose or suggest that the polymer beads form a single layer of microspheres randomly dispersed with a uniform density on a substrate. Figure 2 of Han et al. shows overlapping polymeric beads that are clustered. Figure 4A also shows at least two beads overlapping in the lower left quadrant. Han et al. further does not disclose or suggest that a single layer of microspheres randomly distributed with a uniform density on a substrate be present in a gel. Thus, Han et al. does not overcome the deficiencies of Pierce et al. or Walt et al.

For at least the above reasons, reconsideration and withdrawal of the rejection of claims 27, 28, 30-34, 43, and 51 are in order and are respectfully requested.

All of claims 1-14, 26-28, 30-34, 43-46, 48, and 49 are believed to be patentable over the cited references for at least the reasons stated herein. Further action in the form of a Notice of Allowance is thus respectfully solicited.

Should the Examiner require anything further, or have any questions, the Examiner is invited to contact Applicants' undersigned representative.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Kathleen Neuner Manne', written over a horizontal line.

Attorney for Applicants
Registration No. 40,101

Kathleen Neuner Manne/cak
Telephone: (585) 722-9225
Facsimile: (585) 477-1148